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L9 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2002 ACS
AN 1970:112159 CAPLUS
DN 72:112159
TI Water vapor transport in structurally varied polyurethanes
AU Schneider, Nathaniel S.; Dusablon, L. V.; Snell, E. W.; Prosser, R. A.; Spano, L. A.
CS U. S. Army Natick Lab., Natick, Mass., USA
SO Polym. Prepr., Amer. Chem. Soc., Div. Polym. Chem. (1968), 9(2), 1481-8
CODEN: ACPPAY
DT Journal
LA English
CC 36 (Plastics Manufacture and Processing)
AB Studies were made on the mechanism of water vapor transport in 4 polyurethanes of identical compn. except for the nature of the flexible segment which was varied to include poly(butylene adipate) (I), poly(tetramethylene oxide) (II), poly(propylene oxide) (III), and poly(ethylene oxide) (IV). The H2O concn. in the I-III polyurethanes was 1.6-3%, but increased to 126% in the IV polyurethane, indicating the occurrence of unique water-polyether interactions in this sample. The H2O-vapor transmission rates for I and II polyurethanes were equal, despite a 40.degree. lower glass transition temp. for II polyurethane which should lead to a 25 times higher diffusion const. based on the Williams-Landell-Ferry equation. The transmission rate for IV polyurethane increased only tenfold over that of I polyurethane, about one-eighth the increase expected on the basis of the difference in water concns. To explain these discrepancies, sorption isotherms and diffusion consts. were detd. from time-dependent sorption and steady-state transmission at varying upstream pressures. Clustering of water plays an important role in the transport process for all the samples. Addnl., the presence of previously unsuspected amorphous domain structure contributes to the abnormally low diffusion const. in II polyurethane while, due to the high transmission rate in IV polyurethane, correction must be made for the impedance of the external boundary layer.
ST polybutylene adipate; polyethylene oxide; polypropylene oxide; polytetramethylene oxide; water vapor transmission; transport water vapor; polyurethanes water permeation
IT Sorption
 (of water vapor, by urethane polymers, structure in relation to)
IT Urethane polymers, properties
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (sorption by, of water vapor, structure in relation to)
IT Molecular structure-property relationships
 (water vapor sorption of, of urethane polymers)
IT 7732-18-5
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (sorption of, by urethane polymers, structure in relation to)
IT 24936-97-8 25103-87-1 25190-06-1 25322-68-3 25322-69-4
 RL: USES (Uses)
 (urethane polymers from, water vapor sorption by)

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